INFANTRYMAN'S NIGHT VISION NEEDS

UNITED STATES ARMY INFANTRY CENTER

15-Nov-00

OBJECTIVE

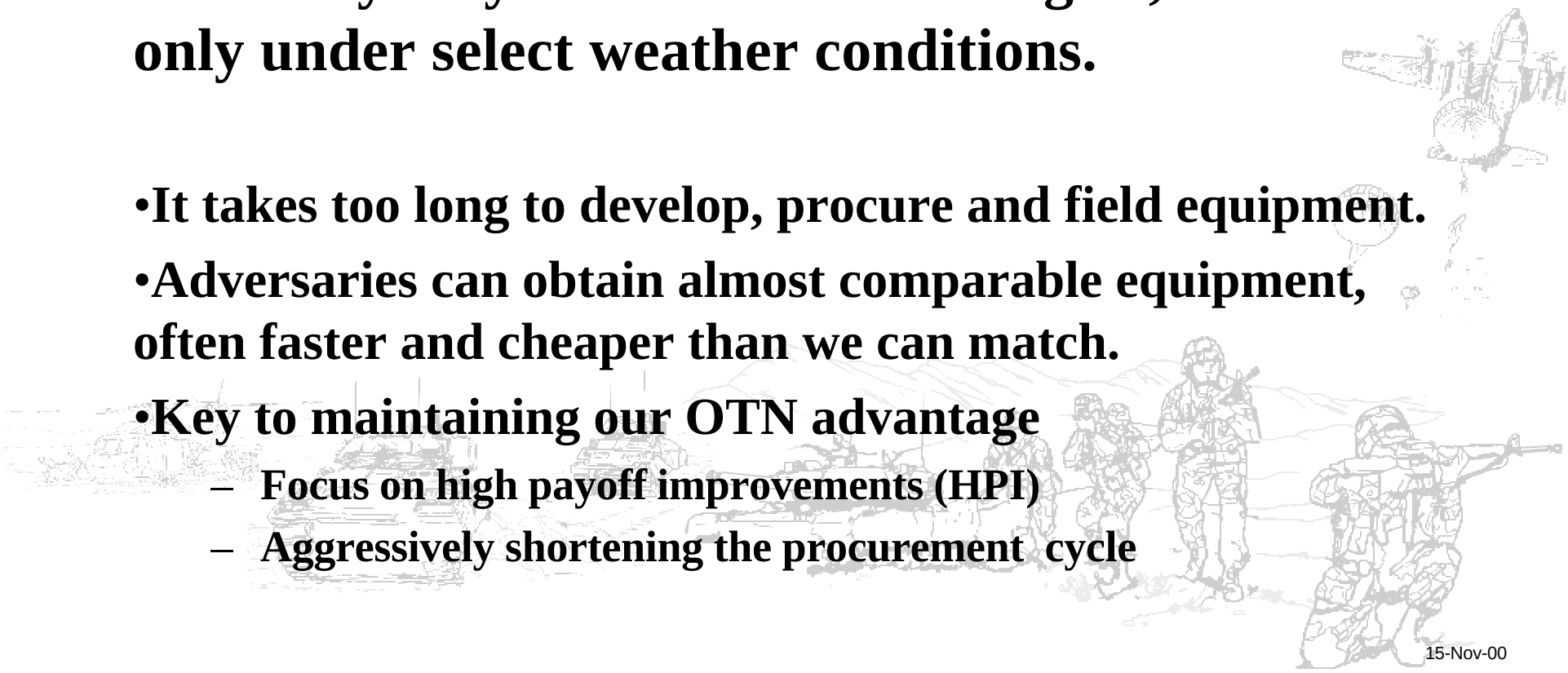
Discuss user perspective of U.S. Night Vision / Own the Night (OTN) modernization efforts, what other countries have accomplished in the OTN arena and outline future Infantry night vision requirements

USAIC NIGHT VISION /OTN ASSESSMENT

Bottom Line

We have made great strides in the OTN arena, and have the best equipment in the world, but still can truthfully only claim to 'rent the night', and then only under select weather conditions.

- **It takes too long to develop, procure and field equipment.**
- **Adversaries can obtain almost comparable equipment, often faster and cheaper than we can match.**
- **Key to maintaining our OTN advantage**
  - **Focus on high payoff improvements (HPI)**
  - **Aggressively shortening the procurement cycle**



SMALL ARMS / NVG IMPROVEMENTS

2nd Generation I2

145 meters, 1/4 moon

2nd Generation 'Plus' I2

225 meters, 1/4 moon

3rd Generation I2

355 meters, 1/4 moon

4th Generation I2

390 meters, 1/4 moon

Small Arms Thermal Sights

550, 1100, 2200 meters, all weather conditions

VEHICLE FLIR IMPROVEMENTS

GEN I FLIR (M1A1, M2A2 ODS)

"Desert Storm View"

Different WFOV, NFOV
Different Ranges
Unique battlefield image

1st Gen

GEN II FLIR I-TAS

Same WFOV, NFOV,
Ranges as M2A3
Similar battlefield image

2nd Gen

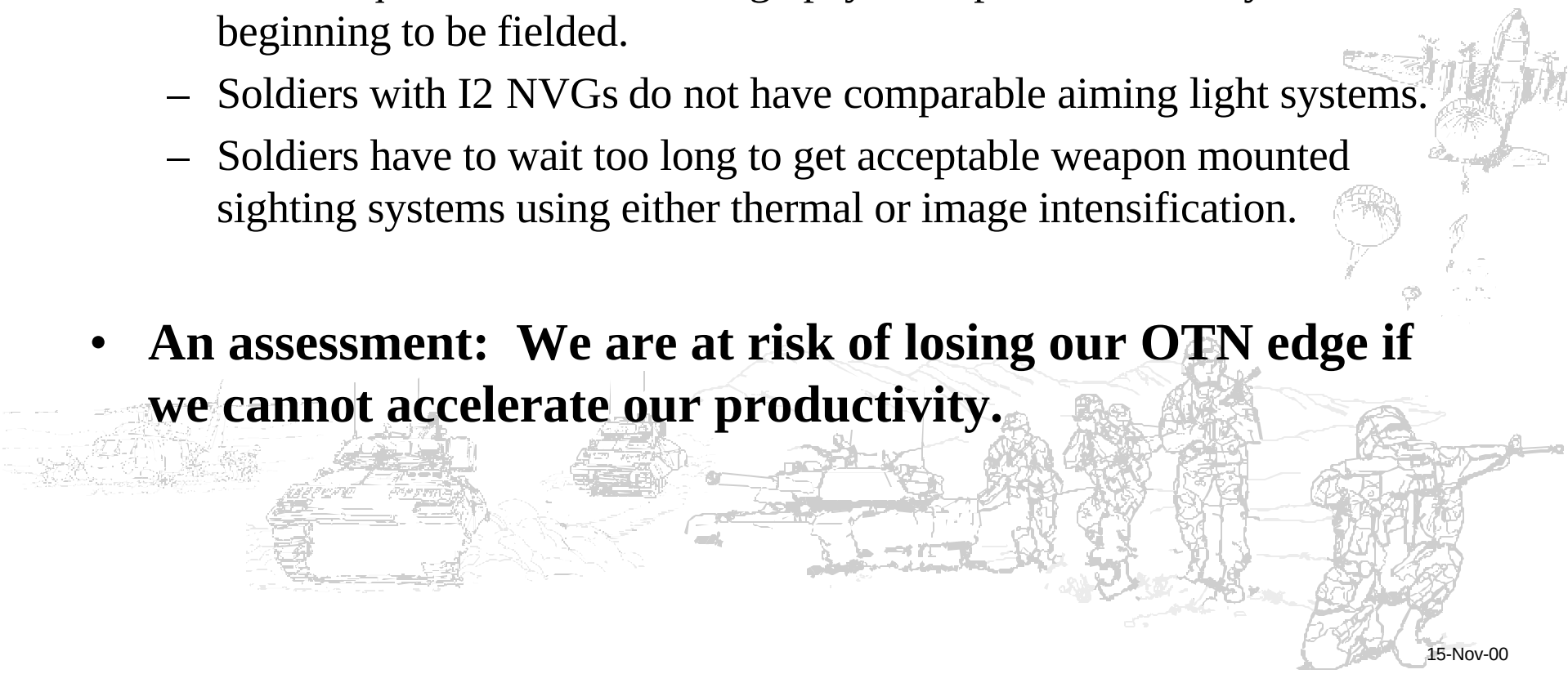
GEN II FLIR (M1A2/M2A3/LRAS3)

Same WFOV, NFOV,
Ranges
Similar battlefield image
Independent commanders viewer

MODERNIZATIONS EFFORTS

- **Army OTN efforts have yielded good and bad news stories**
  - Combat vehicles cannot see in all weather conditions.
  - 1991 Iraqi War aided vision high payoff improvements only now beginning to be fielded.
  - Soldiers with I2 NVGs do not have comparable aiming light systems.
  - Soldiers have to wait too long to get acceptable weapon mounted sighting systems using either thermal or image intensification.

- **An assessment: We are at risk of losing our OTN edge if we cannot accelerate our productivity.**



FOREIGN CAPABILITIES

Image Intensification (I^2) Devices

- **Both France and Holland produce GEN II+ NVGs (Nearly identical to our GEN III except in very low light levels)**

- **Other countries purchasing GEN II+ NVGs**

Thermal Devices

- **Many countries have GEN II FLIR technology**

- **Threat FLIR technology is almost as effective as our GEN II (estimated as within 17% of our FLIR performance)**

FOREIGN PROGRAMS
A SNAPSHOT

	Thermal	I2 Goggles	Weapon Sights
Canada	X	X	
France	X	X	X
Germany	X		X
India		X	X
Israel		X	X
Italy	X		X
Netherlands	X	X	
Norway		X	X
Pakistan		X	X
Poland		X	X
Russia	X	X	X
South Africa		X	X
Singapore	X		
Slovenia	X		
Spain	X	X	X
Sweden	X		
Switzerland	X	X	X
Turkey	X	X	X
United Kingdom	X	X	X
United States	X	X	X
Yugoslavia		X	

- Many countries are investing in OTN technologies
- Other countries are actively procuring equipment on the open market
- The message is clear: We cannot assume our forces will retain the technological edge if we do not improve our development and procurement processes.

DISMOUNTED SOLDIER
NIGHT VISION SYSTEMS EVOLUTION

PRESENT SYSTEMS **EMERGING** **FUTURE**

GOGGLES

NIGHT VISION GOGGLES MONOCULAR NVD,
AN/PVS-7D **AN/PVS-14 & 3X EXTENDER**

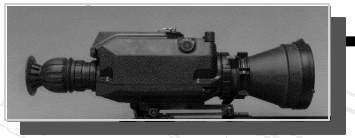


ENHANCED NIGHT VISION GOGGLES **FUSION**

SMALL ARMS SIGHTS

AN/PVS-4/AN/TVS-5 **25MM GEN III TUBE** **TWS, AN/PAS-**





OBJECTIVE INDIVIDUAL COMBAT & CREW SERVED WEAPON SIGHT **FUSION, WIDE FOV**

DISMOUNTED SOLDIER
NIGHT VISION SYSTEMS EVOLUTION

PRESENT SYSTEMS **EMERGING** **FUTURE**

LASER DEVICES

TARGET POINTER/ ILLUMINATOR/AIMING LIGHT, AN/PEQ-2

IR AIMING LIGHT AN/PAQ-4C

INTEGRATED LASER WHITE LIGHT POINTER

DISMOUNTED SOLDIER COMBAT IDENTIFICATION

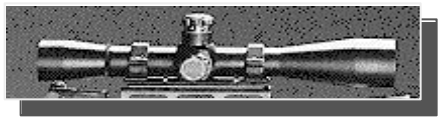
OBJECTIVE INDIVIDUAL COMBAT &CREW SERVED WEAPON SIGHT

DISMOUNTED SOLDIER
NIGHT VISION SYSTEMS EVOLUTION

PRESENT SYSTEMS | **EMERGING** | **FUTURE**

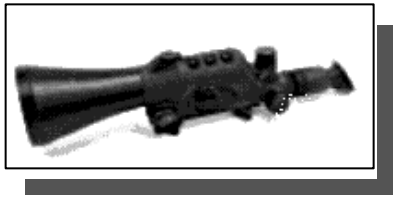
SNIPERS

LEUPOLD SNIPER DAY SIGHT



AN/PVS-10 SNIPER DAY/NIGHT SIGHT

HEAVY SNIPER DAY/NIGHT SIGHT

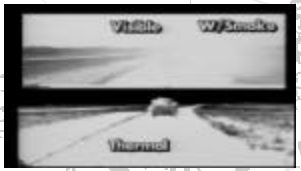


FUSION

DRIVING

NIGHT VISION GOGGLES AN/PVS-7D

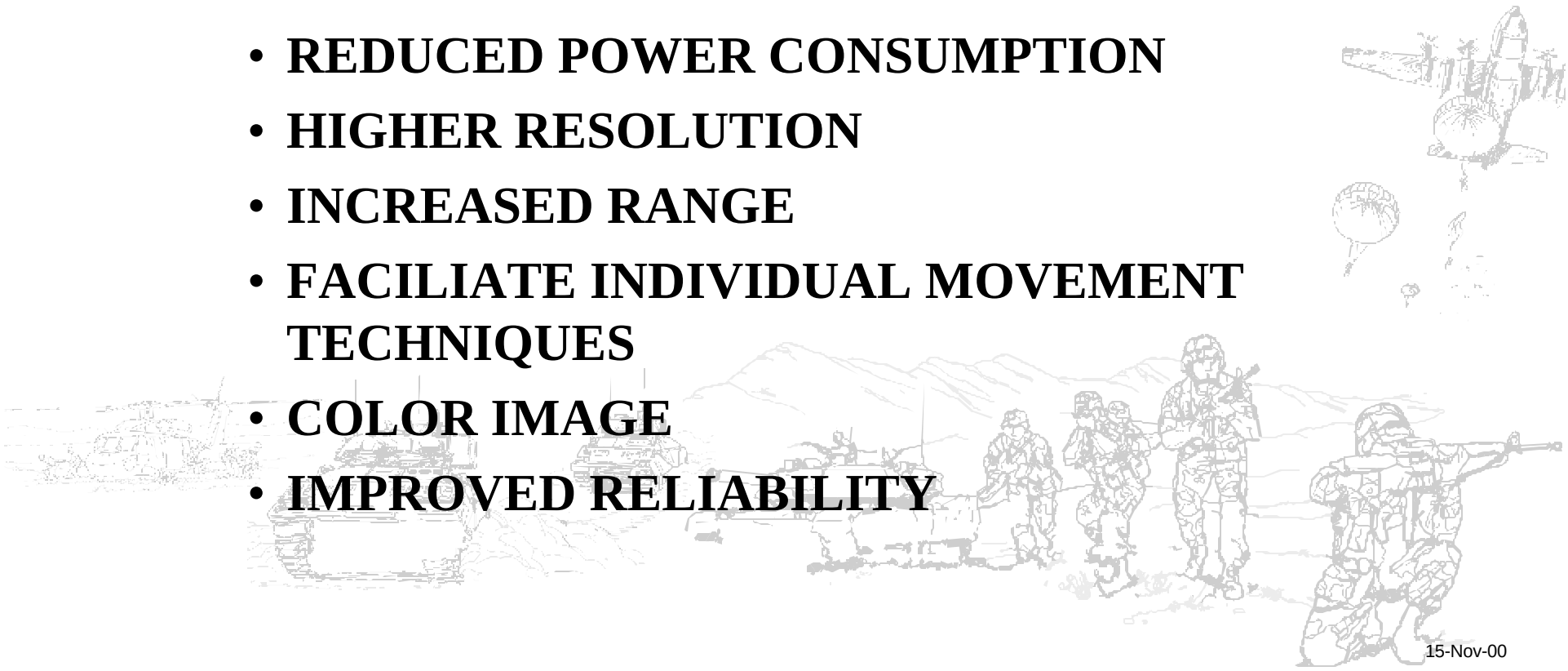
DVE



FUSION

TOP DESIRED ENHANCEMENTS

- **MULTI-SPECTRAL IMAGE FUSION**
- **LESS WEIGHT**
- **SMALLER**
- **REDUCED POWER CONSUMPTION**
- **HIGHER RESOLUTION**
- **INCREASED RANGE**
- **FACILIATE INDIVIDUAL MOVEMENT TECHNIQUES**
- **COLOR IMAGE**
- **IMPROVED RELIABILITY**



Individual Soldier Sensors

Soldier Born Sensors - Product Line Analysis

Current Items:

Desired Enhancements are in priority order

Lightweight Video Reconnaissance System (LVRS) Provides
nage capture and transmission
apabilities for reconnaissance units.
**Enh : 11 ,2,3,4,7, 5 ,4,13,25,1*

Mini- Eyesafe Las
Observation Set (M
Provides lightweigh
between 50and 9,9
compass and vertic
**Enh : 2,3,4, 20 ,1*

P
in
du
*

Monocular Night V
(MNVD)
Provides light weig
for use observatio
**Enh : 19 ,2 ,3 ,5,4*

*

Land Warrior Nigh
Provides night time
data, TWS, I2 tube
**Enh :20,33,1,2,4,1*

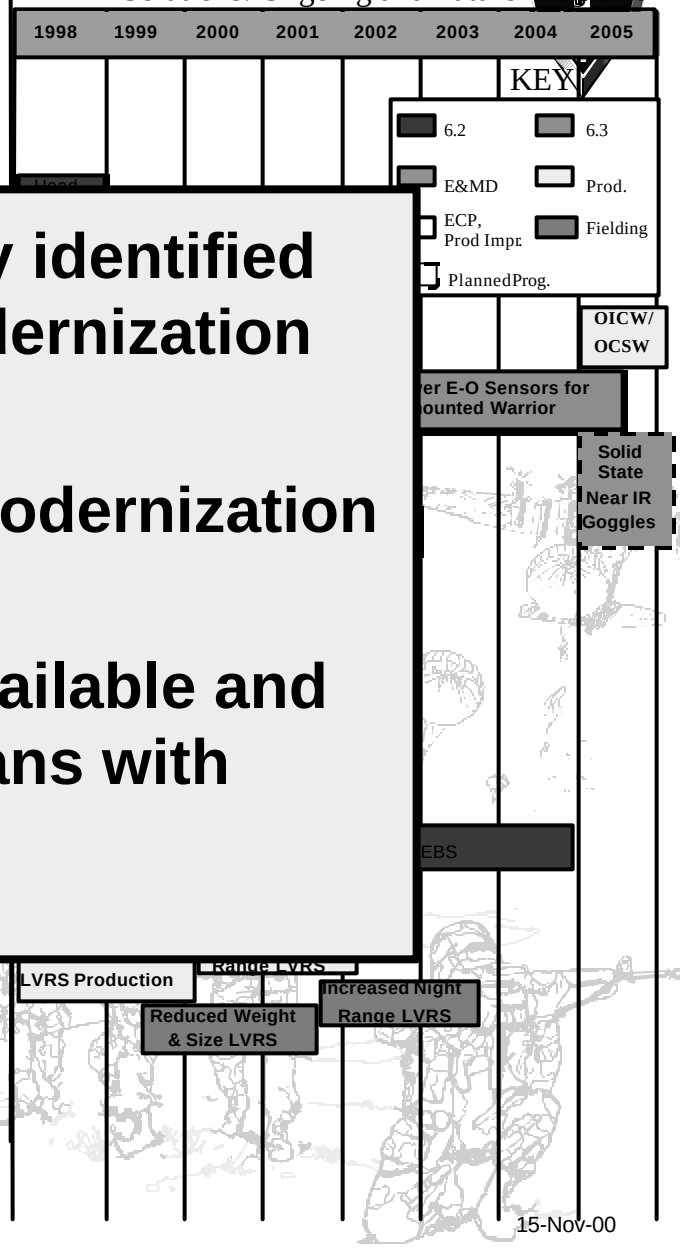
Desired Enhancements:

1. Image fusion
2. Reduce weight
3. Reduce size
4. Reduce power consumption
5. Increase resolution
6. Widen field of view
7. Increase range

EMD & PI Accomplishments

1. MELIOS mounts for M982/ M983 Night Vision Devices design provides night operation capability.
2. New battery will provide a 5X

Solutions: Ongoing and Future Programs



- **Combat developers have already identified and documented future OTN modernization requirements.**
- **Efforts are in place to execute modernization plans.**
- **OTN user representatives are available and free to discuss modernization plans with industry.**

Science and

Low Power Uncooled IR HTI Demo: Develop common uncooled IR Technology for HTI Upgrades to TWS, OICW/OCSW, and Javelin. Includes smart power management and low power electronics.

Low Power EO Sensors for the Warrior: Develop lightweight low power, "micro-size" common module sensor/display hardware for personnel. Incorporates image fusion, far and near IR. Miniature flat panel displays should consume 40% less power.

Solid State NIR Sensor: Solid state sensor, operating in the .4 - 1.8 micron region with 100 times more photon flux than I2 tubes will eliminate bright light flash outs and provide longer range, eyesafe IR laser pointers. Direct video output for image fusion. Targets through conventional camouflage

television. Miniaturizes fusion electronics onto 4"X5" card reducing power weight and size.

Uncooled IR DUAP: Improved generation of low cost uncooled IR sensor technology.

Accomplishments:

Head Mounted Thermal Imager: Developed uncooled helmet mounted sensor with pop down display. Phase II integrates I2 CCD image for summation.

INFANTRY SCHOOL POINTS OF CONTACT

COL F. STONE
Director
COM (706) 545-1316 DSN 835-1316
stonef@benning.army.mil

MAJ DAVE McGLOWN
Chief, Electronics & Special Development
COM (706) 545-5069 DSN 835-5069
mcglownd@benning.army.mil

Mr. Doug Hughes
Project Officer, Night Vision Equipment
COM (706) 545-4950 DSN 835-4950
hughesd@benning.army.mil